COMMUNICATIONS / NETWORKS

Richard Raines
Associate Professor
PhD, Virginia Polytechnic Institute and State University, 1994

- Satellite Communications
- Low-earth orbit satellite networks
- High-speed communication networks
- Modeling and simulation

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Michael Temple
Assistant Professor of Electrical Engr
PhD, Air Force Institute of Technology, 1993

- Digital, spread spectrum, and transform domain communications
- Complex waveform generation and analysis
- Electromagnetic propagation phenomenology
- Adaptive and Interferometric Clutter Erasure (ACE/ICE)

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The Communications Networks Research Group provides innovative solutions to advance communications capabilities for the Air Force and DoD, as well as advancing the state-of-the-art in communication networks through outstanding research.

The Communications Networks Research Group supports projects at the M.S. and Ph.D. graduate education levels. Students investigate and solve engineering problems relevant to the military, DoD, and national agencies.

Current communications networks research areas include satellite/ground-based communications networks, coding and information theory, mobile and portable radio networks, routing in wireless ad-hoc networks, digital and spread spectrum communications, transform domain/interference avoidance communications, waveform coding, and medium access control protocols. Departmental facilities include a communications modeling and simulation laboratory (COMSL) with Unix-based workstations and OPNET simulation modeling and analysis software.

Our customers include the Air Force Communications Agency, Air Force Research Laboratory, NASA, USAF Space and Missile Systems Center, USAF Battlelab Integration Division, Joint Warfare Analysis Center, US Pacific Command, and the US Army Signal Command.

Our research is complemented by multidisciplinary communications and network curriculum offered in the department. Our curriculum captures relevant aspects of electrical engineering, computer engineering, satellite communications, digital communications and experimental research methodology as applied to communications networks.

Selected examples of recent research titles include: Non Co-operative Detection of LIP/LPD Signals Via Cyclic Spectral Analysis, Pseudorandom Code Generation for Communication and Navigation System Applications, Graphical User Interface and Microprocessor Control of a Pseudorandom Code Generator, Design and Simulation of a Transform Domain Communication System, Synchronization of a Transform Domain Communication System, Turbo Codes for Wireless Mobile Communication Systems Applications, A Performance Analysis of the Iridium Low Earth Orbit Satellite System, A Comparative Analysis of Mobility Management Schemes in a Low Earth Orbit Satellite Network Performance Analysis of TCP Enhancements in Satellite Data Networks, A Comparative Analysis of the Iridium, and Globalstar Satellite Transmission Paths Performance Analysis of Dynamic Routing Algorithms in an IRIDIUM-like Low Earth Orbit Satellite System.

Rusty Baldwin
Assistant Professor of Computer Engr
PhD, Virginia Polytechnic Institute and State University, 1999

- Wireless local area networks
- Network protocols
- High-speed communication networks
- Modeling and simulation

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